# Instructions

## for Installing and Operating

## The New Lightning

4000 M. A.
DIATHERMY
Cabinet

> *"Nothing worth while*
> *was ever gained*
> *without*
> *effort."*

**A. S. ALOE CO.**

1819 Olive Street St. Louis, Mo.

# "NEW LIGHTNING"

## 4000 M. A.
## DIATHERMY
## Cabinet

*This Book Contains:*

**Essentials of Diathermy**
Pages 3 to 8

**Instructions for Operation**
Pages 9 to 20

**Outline of High Frequency Therapy**
Pages 21 to 36

**List of Accessories**
Pages 37 to 47

**A. S. ALOE CO.**

1819 Olive Street St. Louis, Mo.

## INTRODUCTORY

The Physician does not administer a new drug until he has thoroughly acquainted himself with the technic of medication; the Surgeon does not employ a new operative procedure until he has fully mastered the important fundamentals; so, it is fitting that some study be given to the simple mechanics of High Frequency currents and their therapeutic action before attempting actual application.

In a brief treatise on the subject, it is impossible to discuss fully the physics of these currents, or to give detailed technic of their many uses. The employer of this therapy may extend his knowledge to any desired limit by consulting the various text books available on the subject.

Physiotherapy is not a system of medicine, but it is without question one of the most valuable aids ever offered to the treatment of disease, and it deserves the same earnest effort and faith that characterized the practitioner's preliminary preparation. "Nothing worth while was ever accomplished without effort," and the effort to become proficient in the operation of the "NEW LIGHTING" Cabinet will inevitably result in added earning power, increased prestige, and greater personal satisfaction through improved service to suffering mankind.

# Foreword

## ESSENTIALS OF DIATHERMY AND OTHER HIGH FREQUENCY MODALITIES

The principle of the therapeutic action of all high frequency currents applied to the human body is the production of heat WITHIN the tissues. It is generally known that all forms of radiant heat are relatively superficial in their action, whereas, heat as applied by the method known as Diathermy reaches to the deepest structures, and it can be controlled to deliver any desired temperature ranging from the mild, sedative warmth necessary for Medical purposes to the grossly destructive coagulation needed for surgical procedure.

A brief analogy of the principle used in commercial heating devices, like the electric range or the electric iron, may serve to give a clearer picture of why this action takes place.

It is common knowledge that an electric current applied to a resistance coil causes the coil to heat. The amount of heat produced depends upon the resistance of the coil and the amount of current applied, and may be expressed in an indisputable electrical law: the greater the resistance, the greater the resulting heat, if the same amount of current is applied. Likewise the heat produced in a given resistance coil will increase in direct proportion to the amount of current applied.

This same condition holds true in the application of Diathermy, in which case the body is the resistance medium, and the high frequency currents, the current applied, so that parts of the body offering greater resistance to the passage of the current will produce a greater heat at a given milliampere dosage than parts offering little resistance.

Likewise, greater milliampere dosages will produce greater heat when applied to tissues offering resistance.

Therefore, it may be said that the amount of heat produced in human living tissue depends upon three factors, namely:

1. Structure of tissue to be heated.
2. Size of electrodes employed.
3. Milliamperes of current applied.

Considering the anatomical structure of the human body, it is quickly understood that dense, bony tissue offers a greater resistance to the passage of a current than the softer, more fluid muscle tissues. From all of this the deduction is simple that 1000 milliamperes of current applied to a knee joint will result in much greater heat than 1000 milliamperes of current applied to the abdomen or thigh, if the same size electrodes are used in both cases.

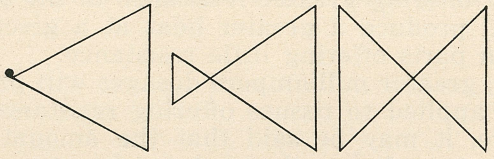
The size of the electrodes employed also have a direct bearing on the amount of heat produced in any given tissue. For example, 1000 milliamperes of current applied through an electrode 2 inches by 2 inches (4 sq. in.) will have a very different effect from 1000 milliamperes applied through electrodes 5 inches by 5 inches (25 inches). This is due to the difference in current density on the electrodes. A homely illustration of this effect may be seen in the painter covering a surface. If he has but one gallon of paint he can cover a small surface with many coats, but if the surface area is increased many times, the same gallon will furnish but one thin coat.

From this it can be seen that if the same milliampere dosage was given through the same type of tissue, using first, electrodes of 4 square inches, and then electrodes of 20 square inches, the greater heat would be produced from the use of the smaller electrode. Therefore, it may be said that with equal milliampere dosages, through similar tissue structures, the smaller the electrode surface, the greater the heat produced.

It is generally accepted that if electrodes of equal size are used, the area of greatest heat lies half-way between them. Also, if electrodes of unequal size are employed, the greater heat will be produced in the vicinity of the smaller electrode. These facts are often of importance in localizing the heat in organs lying posteriorly or anteriorly.

If electrodes of UNEQUAL size are used, always calculate the dosage from the SMALLER electrode.

The following illustration serves to visualize this:



It is self evident that on electrodes of a given size through tissue of given structure, the greater the milliampere dosage used, the greater will be the resulting heat.

From this it is possible to evolve a safe guide to use in the application of Diathermy for Medical purposes. NEVER EXCEED A DOSAGE OF 100 MILLIAMPERES PER SQUARE INCH OF ELECTRODE SURFACE.

IT IS SAFER AND ALSO CUSTOMARY TO USE ABOUT 65 MILLIAMPERES PER SQUARE INCH.

It is of utmost importance to see that all metal electrodes and applicators make firm contact with the skin in giving Diathermy treatments. If this precaution is ignored, the patient will be subjected to an unpleasant pricking sensation under the electrode, and if this condition is not corrected, it may produce a burn or blister. Electrodes may be held in place by bandages, sand bags, hot water bottles, or by hand.

Many technicians advocate the use of soap lather between the electrode and the skin, but the present tendency is not in favor of this practice on account of its adding additonal resistance and causing undue heating of the skin surface.

ALL TREATMENTS SHOULD BE STARTED AT A LOW MILLIAMPERE DOSAGE, AND AT LEAST FIVE MINUTES CONSUMED IN SLOWLY INCREASING THE DOSAGE UNTIL THE DESIRED MAXIMUM IS REACHED. This practice allows for skin excretions to provide a perfect contact for the electrodes, and it will be found that greater heat can be tolerated by the patient without any discomfort.

A CARDINAL RULE TO FOLLOW IS THAT THE PATIENT'S TOLERANCE PROVIDES THE SAFEST GUIDE TO DIATHERMY TREATMENTS.

It should be remembered that Diathermy means to heat through, so that it is the indicated therapy in EVERY CASE where heat is desired. This also accounts for the two contra-indications, as it is generally understood that heat in any form is not indicated in either PUS CASES WITHOUT DRAINAGE, or in any case liable to HEMORRHAGE. However in pus cases after draining has been established, mild Diathermy is an excellent adjunctive therapy.

By careful consideration of the fundamentals governing the application of the various high frequency modalities to the human body, and by thorough familiarity with the function of the controls on the apparatus, the novice should experience no difficulty in attaining the same success that hundreds of others are enjoying every day.

## HIGH FREQUENCY MODALITIES

DIATHERMY, DIRECT.—A bi-polar application in which the tissues are heated between two electrodes or applicators applied in direct contact with the skin, the tissue itself forming the path of the current; used to obtain heat in deep structures; ACTION—sedative; relieves pain; removes congestion and stasis; increases blood metabolism; promotes active local hyperemia.

DIATHERMY, INDIRECT.—A mono-polar application in which the tissue is heated between an electrode (usually an auto-condensation pad) and the operator's finger tips; used for those parts of the body not adaptable to the application of metal electrodes, as the eye, ear, etc.; ACTION—the same as Direct Diathermy, but with slightly less deep effects.

MEDICAL DIATHERMY.—Either Direct or Indirect Diathermy. A term used to convey the meaning that the current is to be confined within physiological limits and not carried to the point of destruction of tissue.

AUTO-CONDENSATION.—A bi-polar application in which the entire body acts as one plate of a condenser and the autocondensation pad the other plate. Applied with the pad as one electrode, and either a metal handle held in the patient's hands, or a large metal pad on the abdomen, as the other electrode. ACTION— sedative; promotes eliminative processes; decreases blood pressure; increases body temperature; promotes metabolic processes.

SURGICAL DIATHERMY.—A term used to convey the meaning that the current is used to the extent of tissue destruction. See Electro-coagulation, Fulguration, Desiccation.

ELECTRO-COAGULATION. — A bi-polar application in which sufficient heat is produced to coagulate tissue in situ. Applied with a large metal pad in skin contact as one electrode (usually termed inactive) and the other electrode (either a needle, knife or metal button) placed in or on the tissue to be destroyed. Used as a surgical method which supersedes actual cautery; ACTION—purely destructive by deep coagulation; seals off capillaries and lymphatics, preventing metastasis; bloodless.

FULGURATION, DIRECT.—A mono-polar application in which tissue is destroyed more or less superficially. The electrode is a needle or point from which a live spark is allowed to play upon the lesion to be destroyed. Used only in superficial lesions and the destruction of papillomata of the bladder. ACTION—destruction by carbonization.

FULGURATION, INDIRECT.—A mono-polar application similar to Direct Fulguration with the exception that the patient is seated upon the auto-condensation pad and the sparks drawn from the lesion to a point or needle held in the operator's hand. ACTION—same as Direct Fulguration.

DESICCATION.—A mono-polar application very similar to Fulguration with practically the same effect, but by using smaller dosages the tissue is dehydrated rather than carbonized. ACTION—Destruction by dehydration.

VACUUM ELECTRODES.—A mono-polar application with the various special vacuum electrodes for surface and orificial work. ACTION—Stimulating, promotes circulation and generates ozone.

NOTE:—BI-POLAR designates the use of two cords or connections to complete the circuit. MONO-POLAR designates the use of but one cord or connection, always used from the Tesla post on the apparatus.

## EXPLANATION OF DIAGRAM

"New Lightning" Cabinet Operating Panel

1.—Connection for Line Current.
2.—Connection for Foot Switch.
3.—Main Line Switch.
4.—Pilot Lamp.
5.—Three Section, Six Point Spark Gap Unit.
6.—Main Current Control Switch.
7.—Milliampere Meter.
8.—Milliampere Meter Control Switch.
9.—Milliampere Meter Protection Fuse.
10.—Tesla Post.
11.—Indifferent Terminal.
12.—Low Voltage Terminal.
13.—Medium Voltage Terminal.
14.—High Voltage Terminal.

## INSTRUCTIONS FOR INSTALLATION OF THE "NEW LIGHTNING" DIATHERMY CABINET

A packing list will be found included in the shipment, and this details all of the parts and accessories supplied with the outfit. Items not listed are not included with the regular outfit, and must be purchased as supplemental accessories.

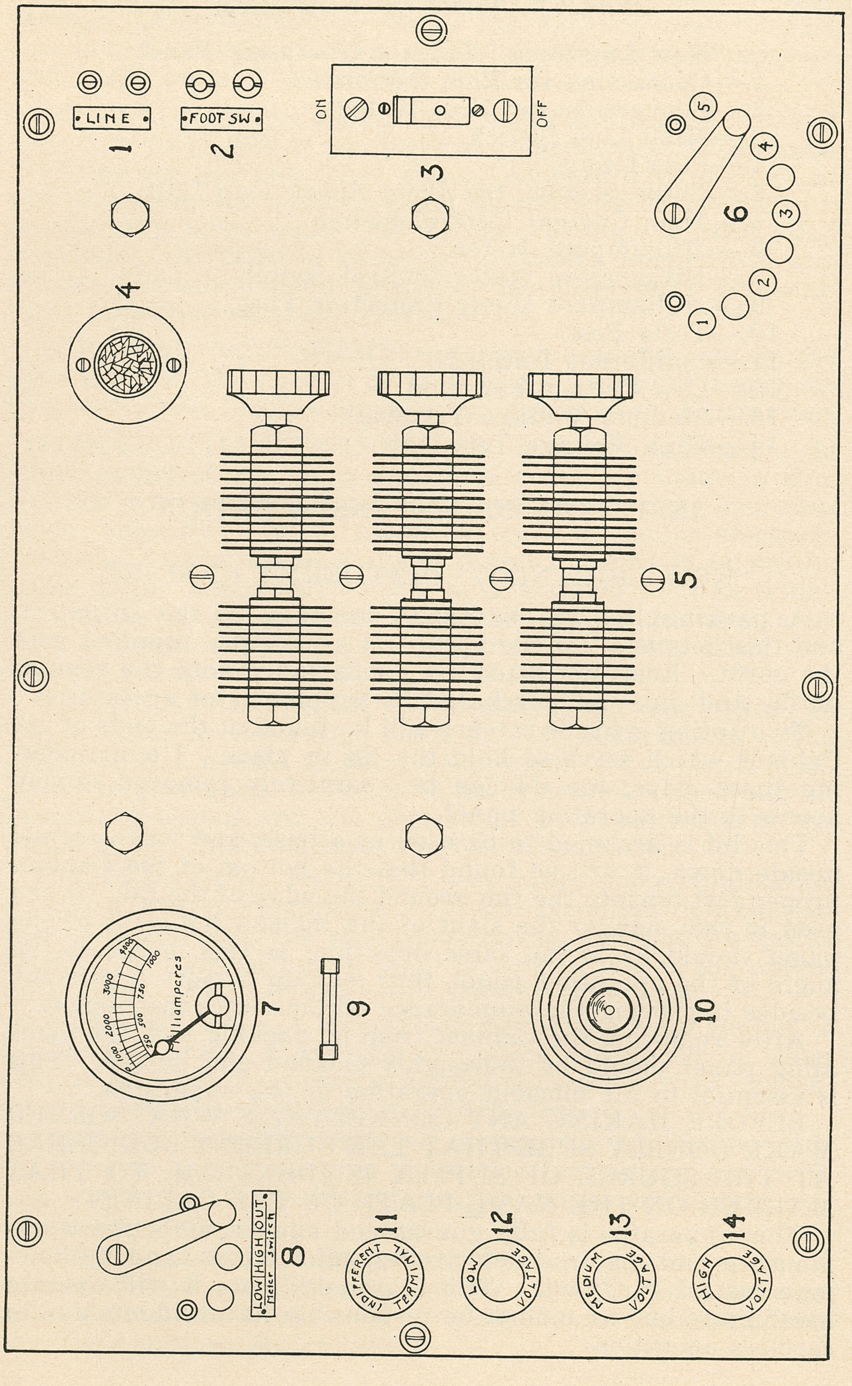
Two spring grips or catches will be found at the ends of the Cabinet which serve to hold the lid in place. Upon releasing these grips, the lid can be completely removed, giving access to the operating panel.

This lid is designed to be used as a base, and when turned upside down, it will be found that the bottom of the Cabinet proper just fits into the rim around the edge of the lid. When used in this manner the slant of the lid and the slant of the panel should be in the same direction, as this increases the angle of the operating panel, thus making it more accessible, besides improving the appearance of the entire instrument.

After removing the Cabinet from its packing box, the operating panel should be thoroughly cleaned and dusted. This is essential to the efficient operation of the apparatus.

BEFORE MAKING ANY CONNECTIONS WHATSOEVER MAKE DOUBLY SURE THAT THE CURRENT FURNISHED AT THE SOURCE OF SUPPLY IS IDENTICAL TO THAT MARKED ON THE NAME PLATE OF THE CABINET.

This apparatus is fully guaranteed against defective workmanship and material; electrodes, pilot lamps, and milliampere meters excepted. With reasonable care it will operate indefinitely but we cannot be responsible for accidents due to careless operation.



# OPERATING INSTRUCTIONS

## (1) CONNECTION FOR LINE CURRENT

A connection cord with an attachment plug for the electric light socket, and a special plug for the Cabinet connection is furnished with the outfit. DO NOT ATTEMPT TO USE THIS APPARATUS ON ANY OTHER CURRENT THAN THAT INDICATED ON THE NAME PLATE OF THE CABINET. Before connecting up the instrument it is best to test the light socket to which it will be attached with an electric light globe to make sure that current is available.

## (2) CONNECTION FOR FOOT SWITCH

The Foot Switch is supplied with a special plug which fits into the connection on the Cabinet. When using a Foot Switch it is imperative that the Main Line Switch (No. 3) is in the OFF position. In using the Cabinet for long, sustained treatments it is not necessary to disconnect the Foot Switch each time, as the Main Line Switch will operate independently. In any of the Surgical Diathermy methods, and in Indirect Diathermy, the Foot Switch is a very necessary accessory.

## (3) MAIN LINE SWITCH

This switch controls the current coming in to the Cabinet. When the small, black knob is pushed toward the rear of the Cabinet, a white dot will appear which indicates that the current is ON. Pulling forward on the knob turns the current OFF. Always be sure that the switch is in the OFF position when leaving the Cabinet after a treatment is finished.

## (4) PILOT LAMP

This lamp is furnished only as an indicator to show when the current is OFF and ON. The lamp glows red when ON. NEVER LEAVE THE CABINET OVERNIGHT OR FOR UNDUE LENGTH OF TIME WITH THIS LAMP BURNING. In case of accidental burning out of the Pilot Lamp, it is not necessary to cease use of the Cabinet as it will function just the same without it. To replace a burned out Pilot Lamp, remove the two small screws holding the jewel in place, and lift off. This exposes the Pilot Lamp socket and the lamps are easily changed.

## (5) THREE SECTION, SIX POINT SPARK GAP

The Spark Gap constitutes the most important regulating feature of the entire Cabinet, and the successful operation of the instrument depends to a great extent upon the proper use of this control. It will be noted that there are three gaps in this unit, and each one operates independently of the others. The function of the Spark Gap is to regulate the amount of current as measured in Milliamperes to be used in any treatment. It will be found that opening the Spark Gaps wider and wider increases the reading on the Milliampere Meter UP TO A CERTAIN POINT, at which point the sparking between the points becomes irregular and sputtering, and, if the points are separated still further, the sparking will cease entirely.

Now, if the Main Current Control Switch is advanced one more button, it will be found that the sparking between the points is resumed and will continue until they are again separated, and so on. From this it will be seen that the Spark Gaps and the Main Current Control switch operate in very close relationship with one another, and it may require some experimentation to obtain the best results.

Note: The gaps are opened by turning the black bakelite knobs in an anti-clockwise direction, and closed by turning clockwise.

In actual treatment it should be made a practice to begin with the Spark Gaps all closed and carefully open one Gap only until a small amount of sparking takes place, then open the next Gap the same distance as the first, and finally the third Gap. It will be noticed that the Milliampere Meter reading will increase as each successive Gap is opened, so that it will be readily understood why in very light treatments only one Gap is used, leaving the others closed. However, all three Gaps should be used whenever possible, as it insures a better balancing of the current output.

The more nearly closed the Gaps are operated, the smoother will be the flow of sparks between the points and the smoother will be the resulting current delivered to the patient, but it is not advisable where a large amount of current is being delivered to have the spark gaps closed too much, as this will necessitate advancing the Main Control lever unnecessarily far. This would cause unnecessary heating of the tungsten spark gap points, also other parts of the apparatus, and the apparatus would also consume more electricity under these conditions than if it were properly used. Therefore, it is the best policy to operate them as nearly closed as is consistent with obtaining the desired Milliampere reading.

UPON COMPLETION OF TREATMENT ALWAYS CLOSE THE GAPS FIRST, and then turn off the current at Main Line Switch (3).

### (6) MAIN CURRENT CONTROLLER

This switch controls the amount of current delivered to the transformer, and as stated in the previous explanation, it operates in conjunction with the adjustment of the Spark Gaps.

It will be noticed that there are five buttons numbered from one to five consecutively with an unnumbered button between each one. The buttons without numbers are not connected and NO CURRENT CAN BE OBTAINED IF THE SWITCH LEVER IS ON ANY OF THESE. Their purpose is to prevent arcing when the lever is moved from button to button, and as an added precaution it is always well to turn off the Main Line Switch when moving the lever from Button 1 to Button 2, etc.

When the lever is on Button 1, the WEAKEST amount of current is delivered to the transformer and thence to the Spark Gaps and to the patient, and when it is on Button 5, the STRONGEST current is delivered.

In beginning treatment the switch lever should first be placed on Button 1, and the Spark Gaps opened gradually as previously explained. Then, if the desired amount of current is not obtained, advance the Main Current Control switch to Button 2, and open the Spark Gap points a little further, etc., until the desired Milliampere reading is obtained.

### (7) MILLIAMPERE METER

The Milliampere Meter measures or registers all D'Arsonval or Diathermy currents as applied from the Terminals (11, 12, 13, 14), but it DOES NOT REGISTER WHEN USING THE TESLA POST.

It will be noticed that there are two scales provided on the Meter, one reading from 0 to 1000, and one reading from 0 to 4000. The use of these scales will be explained in the section on Milliampere Meter Control Switch.

Whenever the apparatus is in use, and the Meter in the circuit, BE VERY CAREFUL THAT THE ENDS OF THE CORD TIPS DO NOT COME IN CONTACT AS THIS WOULD BE APT TO RESULT IN SERIOUS INJURY TO THE METER.

In case of accidental damage to the Meter, it can be removed by pulling up from the panel and the apparatus then operated with the Meter Control Switch on the Button marked "OUT."

### (8) MILLIAMPERE METER CONTROL SWITCH

This switch controls the Milliampere Meter scale reading, or cuts the Meter entirely out of the circuit.

When the switch lever is on the Button marked "LOW," the Milliampere Meter is operating on the lower scale reading from 0 to 1000. When the lever is on the Button marked "HIGH," the Meter is operating on the upper scale reading from 0 to 4000. For example, if the switch is on Button "LOW," and the meter hand points to the first heavy black division on the scale, the current delivered is 250 milliamperes. Now, if the switch is on the Button "HIGH" and the hand points to the same division, the current being used would be 1000 milliamperes. Again if a current of 900 milliamperes was being used and the switch was on Button "LOW", the meter hand would point to a division almost to the extreme right of the scale, and if this same amount of current was being used with the switch on the Button HIGH", the meter hand would barely reach the first heavy black division from the left.

IT IS EXTREMELY IMPORTANT NEVER TO PASS A CURRENT IN EXCESS OF 900 MILLIAMPERES THROUGH THE METER WHEN THE CONTROL SWITCH IS ON THE BUTTON MARKED "LOW."

This warning will be readily understood, since to pass a greater current than that specified, with the control switch causing the meter to read on the low scale, would cause the meter hand to swing clear off the scale to the right and damage the Meter.

When the Meter Control Switch is on the Button marked "OUT," the Meter is disconnected from the circuit and does not register. It should be used in this position when giving treatments from the Tesla Post, or, as previously noted, when the Meter has been removed from the panel for any reason.

In beginning any treatment ALWAYS CAREFULLY CHECK THE METER CONTROL SWITCH AND NOTE WHICH SCALE OF THE MILLIAMPERE METER IS TO BE USED.

**NOTE:—The Milliampere Meter will not register until the cords are connected to the patient.**

### (9) MILLIAMPERE METER PROTECTION FUSE

This Fuse is provided as a protection to the Meter in case too heavy a current is passed through the lower scale, as explained above. When the current approaches the safety limit (about 900 milliamperes) the Fuse will glow a dull red, and if the safety limit is exceeded the Fuse will burn out. It is then necessary to replace it with one of the extra fuses furnished, as the Meter will not read with this fuse burned out. Additional extra fuses may be obtained from the A. S. Aloe Co., St. Louis.

### (10) TESLA POST

This connection delivers a true Tesla current; that is a current of extremely high voltage, sometimes called a "cold spark,"

The Tesla Post is ALWAYS used in the application of the Mono-polar currents, that is Diathermy, indirect; Fulguration, indirect; Fulguration, direct; Desiccation; and Vacuum Electrode applications.

The current delivered from this connection is controlled by the Spark Gaps and the Main Current Control switch exactly as the Diathermy currents are controlled. It should be recalled that the Milliampere Meter does NOT register when this current is being used, and the Meter Control switch should be placed on the Button marked "OUT."

### (11) INDIFFRENT TERMINAL

The Terminals (11, 12, 13, 14.) are the current outlets of the apparatus and deliver the desired currents to the patient. These are the connections used in all Bi-polar applications Diathermy, Auto-condensation, etc.

The Indifferent Terminal is always used as one connection, and the combination of this Terminal with one of the other three determines the type of current used. For example, a treatment given with one cord attached to the Indifferent Terminal and the other cord attached to the terminal marked "LOW VOLTAGE" would result in an application of Diathermy current of low voltage and a medium Milliampere reading.

The combinations possible from these Terminals are: Indifferent terminal and Low Voltage Terminal; Indifferent Terminal and Medium Voltage Terminal; and Indifferent Terminal and High Voltage Terminal.

The various uses of these combinations will be explained in subsequent sections.

Note: The question of voltage in Diathermy is determined by the type of tissue to be penetrated by the current. If the tissue resistance is low, a low voltage current is indicated; if the tissue resistance is high, a high voltage current is indicated.

### (12) LOW VOLTAGE TERMINAL

This Terminal delivers a current of relatively low voltage and is used for very light treatment, as for example a wrist joint, or for very small sufaces.

This terminal is also used by many technicians for electrocoagulation, while many others prefer to use either the medium or high voltage terminal.

To utilize this Terminal one connecting cord is fastened to it, and the other cord to the Indifferent Terminal.

### (13) MEDIUM VOLTAGE TERMINAL

This Terminal delivers a relatively medium voltage, that is, a voltage between that delivered from the "LOW" Terminal and that delivered from the "HIGH" Terminal. This Terminal is used for the deeper portions of the body. It will be observed that THE HIGHEST MILLAMPERE READINGS OBTAINABLE FROM THE APPARATUS are procured when using this Terminal. This connection can also be used for Auto-condensation treatments. To utilize this Terminal, one connecting cord is fastened to it, and the other connecting cord to the Indifferent Terminal. The greatest amount of Milliamperage or current for coagulation is also obtained from this terminal.

### (14) HIGH VOLTAGE TERMINAL

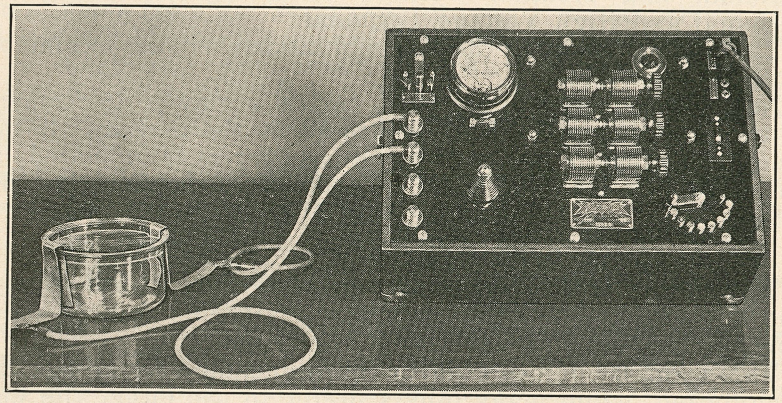
This Terminal delivers a relatively high voltage, and the Milliampere readings will not be as great as those from the Medium Voltage Terminal. The High Voltage Terminal is indicated in Diathermy treatments requiring great penetration; in Auto-condensation treatments, and in certain surgical methods. This High Voltage Terminal is recommended by many text books and technicians as the ideal voltage for the FLASH METHOD Electro Coagulation commonly employed in the treatment of tonsils, hemorroids, etc.

## EXPERIMENTS

**Note: In order to become thoroughly familiar with the Cabinet and the controls, it is suggested that the following experiments be carried out.**

### CONTROLS FOR MEDICAL DIATHERMY

If the operator has had no experience in the application of Diathermy or High Frequency currents, it is suggested that some substitute be used for a patient. A very efficient substitute is a china or earthenware bowl filled with salt water, using one teaspoon full of salt to one cup of water. NEVER USE A METAL BOWL.



**Carefully note position of block tin pieces in bowl, cord connections and position of switches in this experiment.**

Cut two strips of Block Tin about an inch wide and bend them over the sides of the bowl, one on each side directly opposite, so that the ends are well down in the salt water, but separated from each other by two or three inches. BE VERY CAREFUL THAT THE ENDS DO NOT TOUCH.

Study accompanying illustration carefully.

Using the rubber covered treatment cords and the clips furnished, attach one piece of tin to the Indifferent Terminal on the Cabinet and the other piece to the Low Voltage Terminal. (It may be necessary to lay the cords along the table and place a book upon them, as their weight may tend to pull the block tin electrodes out of the bowl).

Connect the apparatus to a light socket supplying the correct current, first making sure that the Main Line Switch (3) is in the "OFF" position. See that all Spark Gap points (5) are closed. Set the Main Current Control Switch (6) on Button "1." Set the Milliampere Meter Control Switch (8) on Button "LOW."

Now, turn on the Main Line Switch (3). The Pilot Lamp (4) will glow and a slight hum will be heard from the Cabinet. CAREFULLY open one of the Spark Gap points until a slight sparking occurs between the points, and notice the Milliampere Meter which will begin to show a reading. IF THE METER HAND MOVES RAPIDLY TO THE EXTREME RIGHT OF THE METER SCALE, SHUT OFF THE CURRENT AT MAIN LINE SWITCH AND MOVE METER CONTROL SWITCH LEVER TO THE BUTTON "HIGH." (Refer again to the text on the Meter Control Switch.)

Open the second Spark Gap slightly until the sparking occurs at this point, and it will be seen that the Milliampere Meter reading is a little higher. Open the third Spark Gap in the same way and note the Meter reading.

Now, advance the Main Current Control switch (6) to the Button marked "2," and note the increased Meter reading. The Spark Gap points can be opened a little wider with each advance of the lever on the Main Current Control switch. Try this switch on each numbered button noting the meter reading in each case, try various adjustments of the Spark Gaps on each button. This experiment will clearly visualize the functions of the various controls on the Cabinet.

### TREATMENT TERMINALS

Begin exactly as in the previous experiment with the exception of setting the Meter Control switch (8) on Button "High." The bowl of salt water is connected as before to Indifferent Terminal and Low Voltage Terminal. By adjustment of the Main Current Control switch and the Spark Gaps, obtain a Meter reading of about 1200 Milliamperes.

Now, WITHOUT CHANGING ANY OF THE CONTROLS FROM THIS SETTING, turn off the current at Main line switch, and transfer one of the treatment cords to the MEDIUM Voltage Terminal, making the combination Indifferent Terminal and Medium Voltage Terminal. Turn on the Main Line Switch and it will be noted that the Milliampere Meter reading has greatly increased.

Again, without changing the controls, make the same test with the cords connected to Indifferent Terminal and HIGH Voltage Terminal. In this case when the current is again turned on, it will be found that the Milliampere reading is lower than on either of the other combinations.

From this experiment it will be seen that an unlimited selection of current dosages may be obtained by using the different Terminal combinations and controlling them with the Spark Gap adjustment and the Main Current Control Switch.

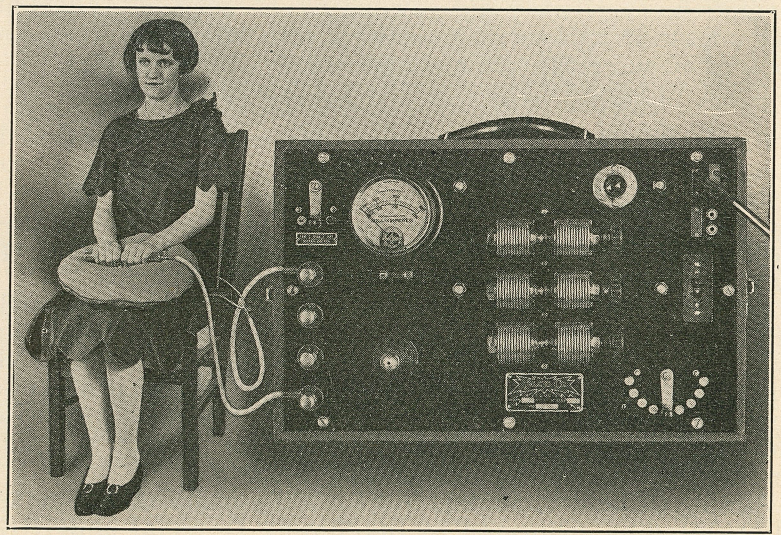
## AUTO CONDENSATION

Having practised on the function of the various controls, and having obtained a working knowledge of their operation, it should now be perfectly safe to use a patient for any of the tests to be made.

Place the folding Auto-condensation pad upon a chair with the short end serving as the seat. Connect the two halves of the Pad together by means of the Bifurcated cord, and connect this to the Indifferent Terminal on the Cabinet using one of the rubber covered treatment cords for this purpose.

Seat a patient on the Auto-condensation Pad with a pillow or thick towel folded across the knees. The patient grasps the large metal Auto-condensation handle in both hands, allowing the hands to rest on the pillow or towel, and NOT UPON THE KNEES. The Auto-condensation handle is connected to either the Medium Voltage Terminal or the High Voltage Terminal (depending upon the treatment desired). The High Voltage Terminal is usually indicated as per illustration.

Set the controls as for the beginning of all treatments, and proceed with the adjustment of the Spark Gaps and Main Current Control switch until the desired Milliampere Meter reading is obtained, usually about 400 to 600 Milliamperes, or until the patient senses a perceptible warmth.



**This illustration shows connections of Auto-condensation seat, apparatus, etc., for auto-condensation. Note machine connections, switches, etc.**

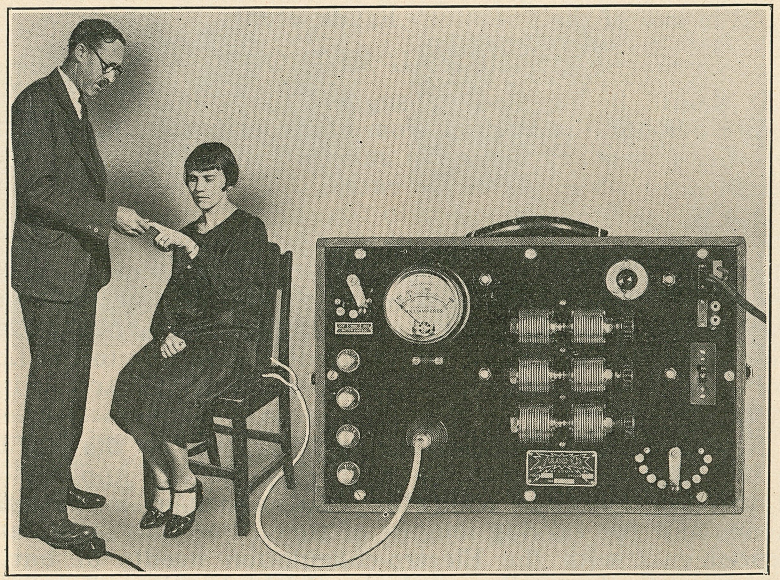
This treatment may be modified and many operators prefer this method by placing the Auto-condensation Pad upon a wooden table and allowing the patient to recline upon it. Instead of the metal handle grasped in the hands, a large metal pad of the Block Tin, about 8 inches by 10 inches, is placed on the abdomen in direct contact with the skin and held in place by a sand bag or some other weight. In this case the pad is connected to either the High Voltage or Medium Voltage Terminal.

## INDIRECT DIATHERMY

It will be recalled that all Indirect applications are Monopolar, and that in Mono-polar methods the Milliampere Meter does NOT register. So that in these experiments the only change to be made is to set the Milliampere Meter Control switch (8) on Button "OUT," which will disconnect the Meter from the circuit.

It should also be remembered that a Foot Switch is essential for these modalities.

See that the Main Line Switch is OFF. Set the controls as for the beginning of all treatments. Place the Auto-condensation pad in a wooden chair as for Auto-condensation



**Showing application Indirect Diathermy to sprained finger. Note use of foot switch by operator, machine connections, switches, etc.**

treatments, and connect it to the **Tesla Post** using the bifurcated cord and one of the rubber covered treatments cords.

Now, open one or more of the Spark Gap points slightly, leaving the Main Line Switch in the OFF position. Place the tips of the fingers upon the patient, covering the part to be treated, and then press down upon the Foot Switch, which action will turn the current "ON."

BE EXTREMELY CAREFUL NEVER TO LIFT UP THE FINGER TIPS WHILE THE CURRENT IS "ON." ALWAYS TURN THE CURRENT "OFF" BY RELEASING THE PRESSURE ON THE FOOT SWITCH BEFORE ATTEMPTING TO MOVE THE FINGERS.

The amount of current to be used is controlled exactly as in the other treatments with the exception that THE CURRENT MUST BE "OFF" WHEN MAKING ADJUSTMENTS.

A slight control of the heat may be obtained by lifting one or more of the fingers making contact. In other words, one finger in contact will produce more heat than three or four, as this is nominally the same as using a smaller electrode surface.

NOTE:—This method of application is most useful in those cases in which it is not practical to apply metal electrodes. For example, the eyes may be treated by placing the finger tips on the closed lids; the middle ear, by inserting a finger into the ear. A single finger joint may be heated by grasping it in one of the operator's hands, etc.

## SURGICAL METHODS

It should be needless to suggest that the novice should obtain personal instruction from an experienced operator before beginning any extensive surgical procedure. However, several experiments can be carried out on uncooked meat which will give some idea as to the efficacy of the method.

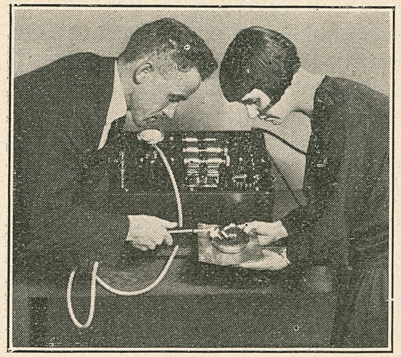
Obtain a thick piece of juicy beef for the tests. For ELECTRO-COAGULATION lay the meat upon a metal pad cut from the Block Tin and connect it to the Indifferent Terminal with one of the rubber covered treatments cords. Connect the Electro-coagulation electrode, either needle or button, to the Low Voltage terminal. Set the Milliampere Meter Control switch on Button "High."

Now, with the electrode either in contact on the surface or partially inserted into the meat, make several applications of various intensities, controlling the current as in all treatments, and for varying lengths of time. Perform these same experiments with the Electro-coagulation needle or button connected to the medium and also the high voltage terminals or binding posts, so that you may better determine the action in Electro-coagulation from all three voltage terminals. This will give you a better idea of the action of the Low, Medium and High Voltage terminals on electro-coagulation than could be obtained by any other method. Note the Milliampere Meter reading in each case, and upon completion of the tests, incise or bisect the meat at the point of application and the coagulated area will readily be seen.

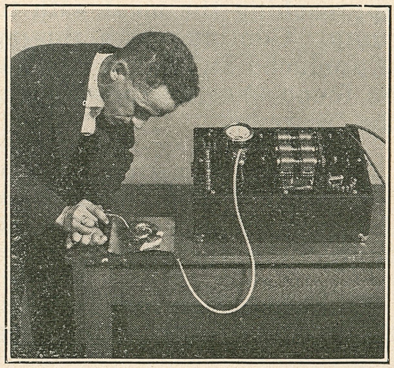
Operation by Surgical Diathermy in living tissue very closely follows the results just obtained in this experiment, and necessitates only a thorough familiarity with the operation of the apparatus, and sound judgment.

Surgical Fulguration, both Direct and Indirect, may be treated by the same method. For Direct Fulguration, connect the Fulguration electrode to the Tesla Post. Set the Meter Control Switch on Button "Out."

Use various settings of the controls and allow the spark produced at the end of the Fulguration needle to play upon the surface of the meat at one point until carbonizing is effected. In this case the meat is not connected in any manner to the apparatus, and may be laid upon a platter or wooden table or better yet, the meat could be held in the hand of an assistant which would provide almost actual working results. (Study the illustration.) After producing the desired effect, again bisect the area treated and note the extent of destruction.

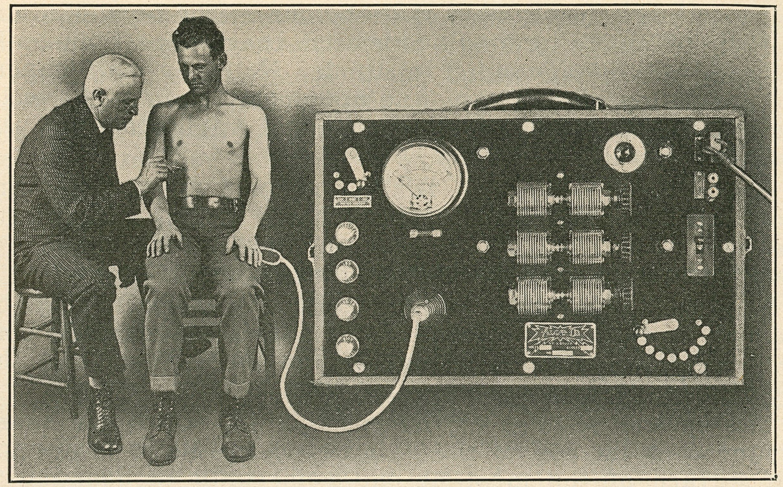


**This illusration shows Direct Fulguration method with meat on a piece of block tin in assistant's hand, which supplies actual working conditions as referred to in text. Note machine connections, switches, etc.**



**This illustration shows Indirect fulguration experiment with a piece of meat as referred to in test. Note machine connections, switches, etc.**

For Indirect Fulguration, place the meat upon a metal pad and connect the pad to the Tesla Post. Hold a bare metal point of some kind in the fingers (the fulguration tips and



**Showing method of Indirect Fulguration. Patient seated on auto condensation seat which is connnected to Tesla post. Operator drawing current from patient's body by means of fulguration electrode or any sharp metal instrument held in operator's hand. Note machine connections, switches, etc.**

holder furnished with outfit is ideal for purpose) and upon approaching the meat with this point a spark will be seen to jump. Continue with this sparking until the desired effect is produced and again bisect and examine. In this case it will be found that a small crater has been formed at the site of the treatment.

In actual practice, the patient is seated upon the Autocondensation pad which is connected to the Tesla Post and the sparks drawn from the lesion to be treated to a point held in the operator's hand.

In Fulguration and Dessication methods, some local anaesthetic is necessary, either freezing or injection.

The following Outline for the application of High Frequency Therapy is offered merely as a guide, and it should not be strictly adhered to as an authoritative text on the subject.

### TECHNICAL SERVICE

THE A. S. ALOE COMPANY MAINTAINS A TECHNICAL SERVICE FOR THE BENEFIT OF PURCHASERS OF THEIR APPARATUS. THIS DEPARTMENT WILL ANSWER QUESTIONS ON SPECIFIC TECHNIC UPON RECEIPT OF INQUIRY.

CORRESPONDENCE TO THIS DEPARTMENT SHOULD CONTAIN DEFINITE INFORMATION PERTAINING TO A BRIEF HISTORY OF THE CASE IN QUESTION TOGETHER WITH THE DIAGNOSIS MADE.

# HIGH FREQUENCY THERAPY

**Typical conditions in which this therapy is indicated**

### ADENOMA

| | |
|---|---|
| Modality | Surgical Diathermy |
| Electrodes | Block tin 8x10 and Surgical electrode |
| Terminals | Indifferent and Medium Voltage. |
| Milliamperes | 500 to 1500 |
| Duration | See Directions |

Directions:—Bind the large block tin inactive electrode to the thigh or place under the reclining patient's back. The electro-coagulation needle is inserted into the tumor mass in as many places as necessary and coagulation carried on until the entire tumor is destroyed.

### ADHESIONS, PERITONEAL

| | |
|---|---|
| Modality | Direct Diathermy |
| Electrodes | Block tin or mesh, 4x6 and 6x8 |
| Terminals | Indifferent and Medium voltage |
| Milliamperes | 600 to 1200 |
| Duration | 30 minutes |

Directions:—Apply the smaller electrode anteriorly on the abdomen over the adherent area and weight with a sandbag. Apply the larger electrode directly opposite on the back. Should be followed by deep massage.

### AMENORRHEA

| | |
|---|---|
| Modality | Direct Diathermy |
| Electrodes | Block tin or mesh, 4x6 and 5x7 |
| Terminals | Indifferent and Medium voltage |
| Milliamperes | 700 to 1500 |
| Duration | 30 minutes |

Directions:—Apply the larger electrode to the back over the lower lumbar region. Apply the smaller electrode over the supra-pubic area on the abdomen. Treatment should be inaugurated about one week before and continue daily until menstruation is established

## ANEMIA

| | |
|---|---|
| Modality | Direct Diathermy |
| Electrodes | Block tin, two 3x10 |
| Terminals | Indifferent and Medium or High |
| Milliamperes | 800 to 1500 |
| Duration | 15 minutes each application. |

Direction:—Apply one electrode anteriorly on the thigh and one electrode posteriorly directly opposite. Treat each thigh in turn. Useful only as an aid to the usual medical treatment.

## ANGINA PECTORIS

| | |
|---|---|
| Modality | Direct Diathermy |
| Electrodes | Block tin or mesh, two 4x6. |
| Terminals | Indifferent and Low or Medium. |
| Milliamperes | 400 to 600 |
| Duration | 20 minutes. |

Directions: — Apply one electrode on the chest over the heart and the other electrode on the back directly opposite. If the chest is exceptionally hairy it should be well moistened with a soap lather, or, better yet, shaved clean. This treatment should not be used if hypertension is a complication.

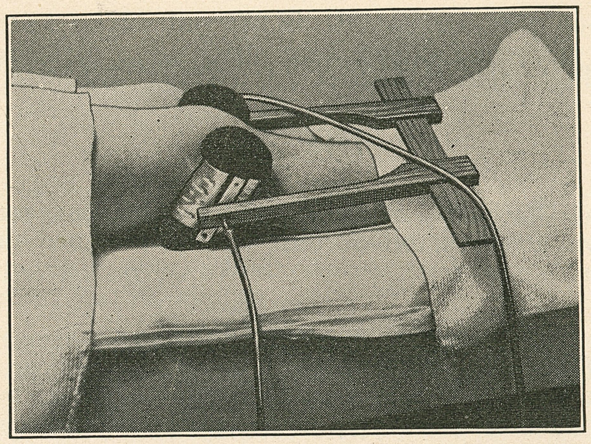
## ANKYLOSIS

| | |
|---|---|
| Modality | Direct Diathermy |
| Electrodes | Block tin or Diathermy Clamp. |
| Terminals | Indifferent and Low or Medium. |
| Milliamperes | Dependent upon part treated. |
| Duration | 30 minutes |

Directions:—Apply electrodes to embrace the joint to be treated, either anteriorly and posteriorly, or laterally. Use sufficient current to obtain strong heating. Should be followed by massage and remedial exercise.

## ARTHRITIS

| | |
|---|---|
| Modality | Direct Diathermy |
| Electrodes | Block tin or Diathermy Clamp. |
| Terminals | Indifferent and Low or Medium. |
| Milliamperes | Dependent upon part treated. |
| Duration | 30 minutes |



**Method of applying sponge clamp to knee or other part of of the body in cases of sprains, arthritis, etc.**

Directions: — Apply electrodes to embrace the arthritic joint either anteriorly, posteriorly or laterally. The so-called cuff method may be used by applying one electrode around the member above the joint and the other electrode in the same manner below the joint. The electrodes used in this manner should not be a complete cuff, but should be cut long enough to embrace only about two-thirds of the circumference of the member.

Current should be applied to the limit of the patient's tolerance, as the more heat created, the better will be the result. Usual medication should be employed in addition to Diathermy. Active foci of infection will of course depreciate the result.

## BRONCHITIS

| | |
|---|---|
| Modality | Direct Diathermy |
| Electrodes | Block tin or mesh, 5x7 and 3x7. |
| Terminals | Indifferent and Low or Medium. |
| Milliamperes | 800 to 1400. |
| Duration | 30 minutes |

Directions:—Apply the larger electrode on the back between the shoulder blades, and the smaller electrode on the chest over the bronchi. Treatment should be continued daily for one week and at least three times a week thereafter until relieved.

## BRUISES

See SPRAINS.

### BURSITIS

Treat as for ARTHRITIS being sure to embrace the Bursal area.

### CANCER

Surgical Diathermy is preferred by many Surgeons as the destructive measure, on account of the lessened danger of metastasis.

### CATARRH, NASAL

See CORYZA.

### CHANCROID

| | |
|---|---|
| Modality | Fulguration. |
| Electrodes | Fulguration Needle. |
| Terminals | Tesla Post. |
| Duration | See directions. |

Directions:—Anaesthetize the area and fulgurate until the lesion is destroyed.

### COLITIS

| | |
|---|---|
| Modality | Direct Diathermy |
| Electrodes | Block tin or mesh, two 5x7. |
| Terminals | Indifferent and Medium. |
| Milliamperes | 1000 to 1800. |
| Duration | 30 minutes |

Directions:—Apply one electrode anteriorly on the abdomen over the colonic area, and the other electrode posteriorly on the back directly opposite. If medication is being prescribed, it is excellent therapy to start Diathermy about fifteen minutes after the medicine is taken.

### CORYZA

| | |
|---|---|
| Modality | Vacuum Electrode. |
| Electrodes | Nasal Vacuum or non-vacuum electrode. |
| Terminals | Tesla Post. |
| Duration | 10 minutes each nostril. |

Directions:—Insert the nasal electrode as far back into the nostril as possible, and increase the current until the patient senses heat without discomfort. The electrode should be moved slowly during the treatment. This treatment may be modified by seating the patient on the auto-condensation pad connected to the Tesla post, and drawing the current to a nasal electrode held in the operator's bare hand.

### CYSTITIS

| | |
|---|---|
| Modality | Direct Diathermy |
| Electrodes | Block tin or mesh, 4x6 and 6x8. |
| Terminals | Indifferent and Medium or Low. |
| Milliamperes | 800 to 1500. |
| Duration | 30 minutes. |

Directions:—Apply the smaller electrode anteriorly over the supra-pubic area, and the larger electrode posteriorly over the sacrum. Advise the patient to drink copiously of water just before treatment, and void immediately after.

### DIABETES MELLITUS

| | |
|---|---|
| Modality | Direct Diathermy |
| Electrodes | Block tin or mesh, 4x6 and 6x8. |
| Terminals | Indifferent and Medium or Low. |
| Milliamperes | 1000 to 1800. |
| Duration | 30 minutes. |

Directions:—Apply the larger electrode posteriorly on the lumbar region, and the smaller electrode anteriorly on the abdomen over the pancreas and liver. This is an excellent adjunctive treatment to the usual medicinal therapy, and treatment should be given about one hour after medication.

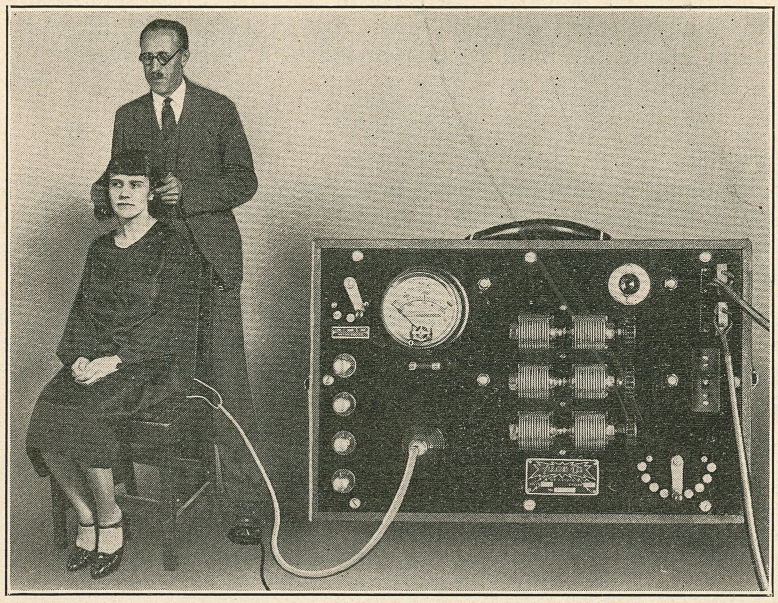
### DYSMENORRHEA

| | |
|---|---|
| Modality | Direct Diathermy |
| Electrodes | Block tin, 5x7, and metal vaginal. |
| Terminals | Indifferent and Low. |
| Milliamperes | 400 to 1000. |
| Duration | 30 minutes. |

Directions:—Place the larger block tin electrode posteriorly over the sacrum and insert the special metal electrode into the vagina, well up into the culdesac. Treat daily for a week before menstruation. In the virgin, a small block tin electrode, 3x5, placed anteriorly over the supra-pubic area, can be substituted for the metal vaginal electrode.

### EAR ACHE

| | |
|---|---|
| Modality | Indirect Diathermy. |
| Electrodes | Auto-condensation pad. |
| Terminals | Tesla Post. |
| Duration | Until relief is obtained. |



**Showing application Indirect Diathermy for earache—operator using foot switch. Note machine connections, switches, etc.**

Directions:—Refer to the section on Indirect Diathermy applications. Seat the patient on the Auto-condensation pad connected to the Tesla Post. Insert the ends of the forefingers into each ear and use enough current to obtain as great heat as the patient can tolerate without discomfort. See illustration.

## EMPYEMA

Treated only after drainage is established. The technic is the same as that used for Pneumonia.

See PNEUMONIA.

## EPIDIDYMITIS

| | |
|---|---|
| Modality | Direct Diathermy |
| Electrodes | Block tin, mesh, or special. |
| Terminals | Indifferent and Low. |
| Milliamperes | Dependent upon method used. |
| Duration | 20 to 40 minutes. |

Directions: With the patient in a reclining position place a block tin electrode, 8x10, under the hips. Instruct the patient to pull the whole scrotom up over the pubes in the cupped palmar surface of the hand, first placing a mesh electrode over the involved area and covering with a folded towel. It may be necessary to moisten the skin with soap lather to eliminate discomfort. If the special Epididymitis electrode is used, fasten the clamp laterally on the testes. Use sufficient current to obtain perceptible heating of the affected parts.

## FRACTURES, AFTER TREATMENT

| | |
|---|---|
| Modality | Direct Diathermy |
| Electrodes | Cuffs of block tin. |
| Terminals | Indifferent and Low or Medium. |
| Milliamperes | Dependent upon part treated. |
| Duration | 30 minutes. |

Directions: Apply a 3 inch partial cuff around the injured member, above and below the site of fracture. Use sufficient current to procure a perceptible warmth, but not the usual extreme heat. The period of disability will be appreciably shortened by the use of this therapy.

## GONORRHEA

| | |
|---|---|
| Modality | Direct Diathermy |
| Electrodes | Special. |
| Terminals | Indifferent and Low. |
| Milliamperes | Dependent upon method used. |
| Duration | See directions. |

Directions: The subject of the Application of Diathermy in the Treatment of Gonorrhea is too extensive to take up in this outline. It is recommended that the practitioner interested in this form of treatment should obtain one of the recent text books on the subject and make a special study of the method.

## HEMORRHOIDS

| | |
|---|---|
| Modality | Surgical Diathermy. |
| Electrodes | Electro-coagulation needle or special. |
| Terminals | Indifferent and Medium or High. |
| Milliamperes | Dependent upon method used. |
| Duration | See directions. |

Directions: Two methods of electro-coagulation are offered in the treatment of Hemorrhoids, and these methods are finding such great favor with the medical profession that they are rapidly superseding both surgical excision and cauterization. Several articles are available which cover the technic in detail.

In the flash method, the field of operation is prepared and the region about the anus anaesthetized. After the exposure of the pile mass, each Hemorrhoid is grasped with an ordinary pile clamp well up to the base. The electro-coagulation needle is inserted through the pile at the base and the current turned on until the area of coagulation appears in the form of blanching. The current is then turned off and the needle withdrawn and inserted in a new place until the entire base of the pile is coagulated, which procedure produces a strangulation of the pile far more effective than the stoutest ligature. The pile is allowed to remain and slough away as usual. Refer also to REMOVAL OF TONSILS for additional detailed technique.

There has recently come into the market a special instrument for this work, which considerably shortens the time necessary for the operation.

It will well repay the general practitioner or Specialist to become thoroughly proficient in this procedure as it offers enormous advantages; less painful; more thorough; less scarring; bloodless; and simple to perform.

## HEADACHE

| | |
|---|---|
| Modality | Indirect Diathermy |
| Electrodes | Auto-condensation pad. |
| Terminals | Tesla Post. |
| Duration | 20 minutes. |

Directions: Refer to the section on Indirect Diathermy. Seat the patient upon the auto-condensation pad connected to the Tesla Post. Localize the current by placing the finger tips upon the forehead and temples during the application, always being very careful that the finger tips are not lifted from the skin surface during the procedure.

## HYPERTENSION

| | |
|---|---|
| Modality | Auto-condensation. |
| Electrodes | Auto-condensation pad and handle. |
| Terminals | Indifferent and High or Medium. |
| Milliamperes | 400 to 700. |
| Duration | 15 to 30 minutes. |

Directions: Refer to the section on Auto-condensation for application. Treatments should be begun at a low milliampere dosage for 15 minutes per treatment, and after the second or third treatment the dosage should be increased and the time lengthened. The best guide to use is to continue increasing the dosage until the patient senses a gradual warmth permeating the entire body. In finishing each treatment the milliamperage should be reduced gradually before turning off the current.

## IRITIS

| | |
|---|---|
| Modality | Indirect Diathermy. |
| Electrodes | Auto-condensation pad. |
| Terminals | Tesla Post. |
| Duration | 10 to 15 minutes each eye. |

Directions: Proceed as for Headache, placing the finger tips over the closed lid of the affected eye and use just enough current to obtain a slight warming of the eye.

## INJURIES, JOINT

See "SPRAINS"

## LARYINGITIS

| | |
|---|---|
| Modality | Indirect Diathermy. |
| Electrodes | Auto-condensation pad. |
| Terminals | Tesla Post. |
| Duration | 15 to 20 minutes. |

Directions: Proceed as for Headache, placing the finger tips over the Larynx and use sufficient current to produce a perceptible heating.

## LEUKORRHEA

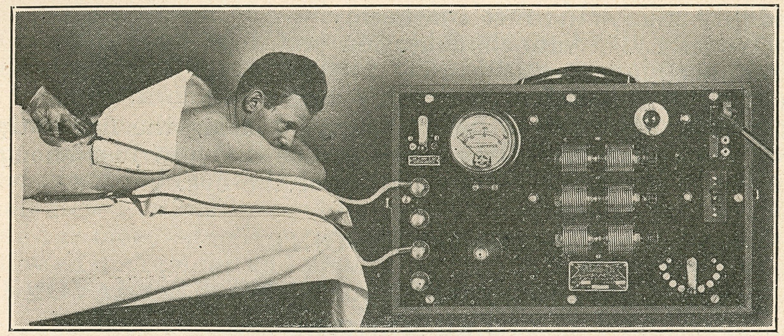
| | |
|---|---|
| Modality | Direct Diathermy |
| Electrodes | Block tin, 8x10, and special vaginal. |
| Terminals | Indifferent and Low or Medium. |
| Milliamperes | 500 to 1000. |
| Duration | 30 minutes. |

Directions: Apply the large block tin electrode to the back over the sacrum. If the electrode is placed upon a folded towel and the patient reclines upon it, the contact will be sufficient. Insert the special vaginal electrode into the vagina engaging the cervix and apply sufficient current to produce heat to the tolerance of the patient. This therapy is very valuable in the treatment of all catarrhal conditions of the vagina and uterus.

## LUMBAGO

| | |
|---|---|
| Modality | Direct Diathermy |
| Electrodes | Block tin, 12x12 and 5x7. |
| Terminals | Indifferent and Medium. |
| Milliamperes | 1000 to 1800. |
| Duration | Until relief is obtained. |

Directions: In no condition are the effects of Diathermy treatments more outstanding than in Lumbago, if properly applied. Place the larger electrode upon a folded towel or blanket and have the patient lie upon this in the prone position. Place the smaller electrode upon the affected area and weight with a sand-bag. Apply sufficient current to obtain the limit of tolerance of the patient, and continue the application until relief is obtained.



Medical Diathermy application for lumbago—method of application of electrodes plainly visible. In practice, sandbag or hot water bottle may be substituted for pressure of hand, as shown. Note machine connections, switches, etc.

### MYCARDITIS

Modality..............Direct Diathermy
Electrodes............Block tin, two 4x6.
Terminals.............Indifferent and Medium.
Milliamperes.......800 to 1500.
Duration...............30 minutes.

Directions: The technic is the same as for "Angina Pectoris," which see.

### MOLES

See "SKIN BLEMISHES"

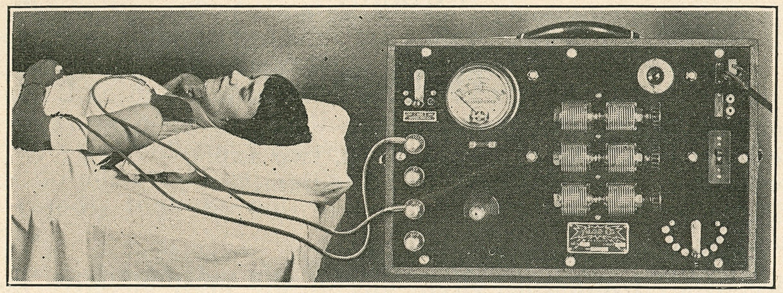
### NAEVUS

See "SKIN BLEMISHES"

### NEURITIS

Modality..............Direct Diathermy
Electrodes............Block tin or Diathermy Clamp.
Terminals.............Indifferent and Low or Medium.
Milliamperes......Dependent upon part treated.
Duration...............30 minutes.

Directions: The technic of application is practically the same as for "Arthritis," which see. In Brachial Neuritis apply a block tin electrode 4x6 over the brachial plexus and a partial cuff electrode around the upper arm. Apply sufficient current to obtain heat to the point of tolerance. Treat daily.



Application Medical Diathermy Brachial Neuritis. Partial cuff electrode applied to arm; other block tin electrode shown on shoulder which extends well down in proximity of brachial nerve. This electrode to be held in place by elastic bandage or suitable weights or padding. Note machine connections, switches, etc.

### NEURALGIA, Facial

Modality..............Indirect Diathermy.
Electrodes............Auto-condensation pad.
Terminals.............Tesla Post.
Duration...............Until relief is obtained.

Directions: Proceed as for "Headache" placing the finger tips over the affected area.

### OSTEOMYELITIS

Modality..............Direct Diathermy
Electrodes............Block tin cuffs or pads.
Terminals.............Indifferent and Low or Medium.
Milliamperes.......Dependent upon method used.
Duration...............30 minutes.

Directions: The course of this disease may be materially shortened by the use of Diathermy. Always be sure that drainage is established and that any sequestra are removed. Begin treatment by applying a cuff both above and below the affected area and apply only sufficient current to produce a slight warmth. Increase the dosage daily until perceptible heat is experienced. Later the current may be applied directly through the area involved by binding block tin pads on either side of the area, laterally or anteriorly-posteriorly.

### OVARIAN NEURALGIA

See "AMERORRHEA"

## OZENA

See "CORYZA"

## PNEUMONIA

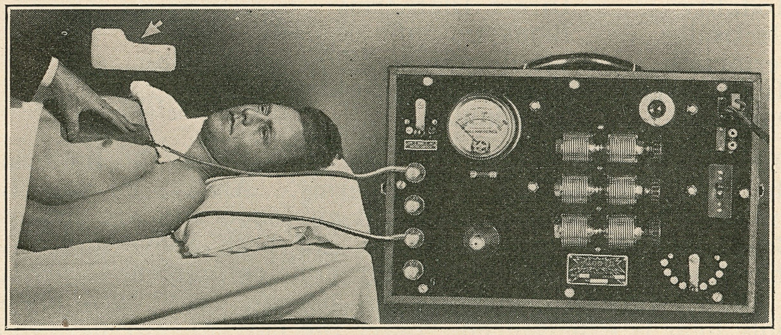
| | |
|---|---|
| Modality | Direct Diathermy |
| Electrodes | Block tin or Mesh, two 4x6. |
| Terminals | Indifferent and Medium. |
| Milliamperes | 800 to 1500. |
| Duration | 20 to 30 minutes. |

Directions: Diathermy offers one of the most effective aids of the armamentarium for the treatment of Pneumonia, and should be instituted at the earliest possible moment in every case. It will repay every Practitioner to devote considerable time to study this application, as it has proven that it assists in the removal of tissue congestion, relieves pain, increases blood metabolism, and promotes absorption of inflammatory products and stasis. It lessens cyanosis, and almost eradicates dyspnea.

The pneumonic process ends by lysis and not crisis.

Treatments may be given as often as two or three times daily, and it will be found that after the treatment, the patient usually enjoys a natural sleep, the typical expiratory grunt will disappear, and a wholesome general improvement will be evident.

In those cases which may have progressed to empyema, it is necessary to institute drainage before beginning Diathermy treatments, and the same caution applies to Pleurisy with fluid present.



**Showing application Medical Diathermy in pneumonia. Sandbag or hot water bottle may be substituted for hand, as shown in illustration. Note machine connections, switches, etc.**
**Just above patient is shown shape of block tin electrode used on back of patient (arrow points to electrode). It is so cut to avoid scapula.**

The technic of application is relatively simple. Apply one electrode anteriorly and the other electrode posteriorly directly opposite, embracing the affected lobe between. If more than one lobe is involved it is considered better technic to treat each separately than to try to cover both at the same time. Use sufficient current to create considerable warmth, but do not over treat, as it is possible to relieve the exudates so rapidly that the patient literally drowns in his own secretions.

It is advised that the student of this therapy obtain one of the current text books on this subject and then utilize the method in every possible case.

## PLEURISY

See "PNEUMONIA"

## PROSTATITIS

| | |
|---|---|
| Modality | Direct Diathermy. |
| Electrodes | Block tin, 5x7, and special prostatic. |
| Terminals | Indifferent and Low. |
| Milliamperes | 800 to 1200. |
| Duration | 30 to 40 minutes. |

Directions: Place the patient in either the dorsal position or on the side, with knees flexed. Apply the Large block tin electrode over the supra-pubic region, either well lathering or shaving the hair. Insert the special prostatic electrode until it is over the gland, usually about one inch beyond the anal margin. If necessary the electrode may be lubricated with "K-Y." It is imperative that the prostatic electrode be held firmly in place, either by hand or with adhesive tape. Employ sufficient current to produce heat to the patients tolerance without discomfort. Treat every other day.

## SCIATICA

Diathermy is used only for relief of pain, and the technic of application is practically identical with that as advocated for "Anemia."
See "ANEMIA."

## SKIN BLEMISHES

| | |
|---|---|
| Modality | Direct or Indirect Fulguration. |
| Electrodes | Fulguration Needle. |
| Terminals | Tesla Post. |
| Duration | See directions. |

Directions: Naevi, warts, moles and all small superficial growths are readily removed without scarring, and this method of removal cannot be too strongly recommended.

Refer to the section on Surgical methods to obtain the detailed technic of operation. In some of the growths involving the deeper layers of the skin it may be necessary to insert the needle into the growth in order to procure the desired result. Blanching of the immediate area is all that is necessary to destroy the growth.

## SPRAINS

| | |
|---|---|
| Modality | Direct Diathermy. |
| Electrodes | Block tin or Diathermy Clamp. |
| Terminals | Indifferent and Low or Medium. |
| Milliamperes | Dependent upon part treated. |
| Duration | 30 minutes. |

Directions: Diathermy offers a classic treatment in every sprain, strain or contusion as it relieves stasis, increases blood metabolism, promotes absorption of inflammatory products and hastens repair.

Apply block tin or the Clamp electrodes to the part to be treated, either laterally or anterior-posteriorly, or use the partial cuff method above and below the joint involved. In the case of a finger joint, the Indirect Diathermy method is of value as explained in the section on Indirect Diathermy.

Employ sufficient current to create heat to the point of tolerance, and continue treatment daily.

## STENOSIS, Gall Duct

| | |
|---|---|
| Modality | Direct Diathermy. |
| Electrodes | Block tin, 3x5 and 4x6. |
| Terminals | Indifferent and Low or Medium. |
| Milliamperes | 500 to 1000. |
| Duration | 30 minutes. |

Directions: In certain conditions involving the gall bladder in which jaundice is present, Diathermy offers a modicum of relief. The usual symtoms of Gall Bladder disease are often improved.

Apply the small electrode over the Gall Bladder anteriorly and the larger electrode directly epposite on the back. Use sufficient current to produce heat to the point of tolerance without discomfort and repeat the treatment daily for the first week, and three times a week thereafter.

## STOMACACE

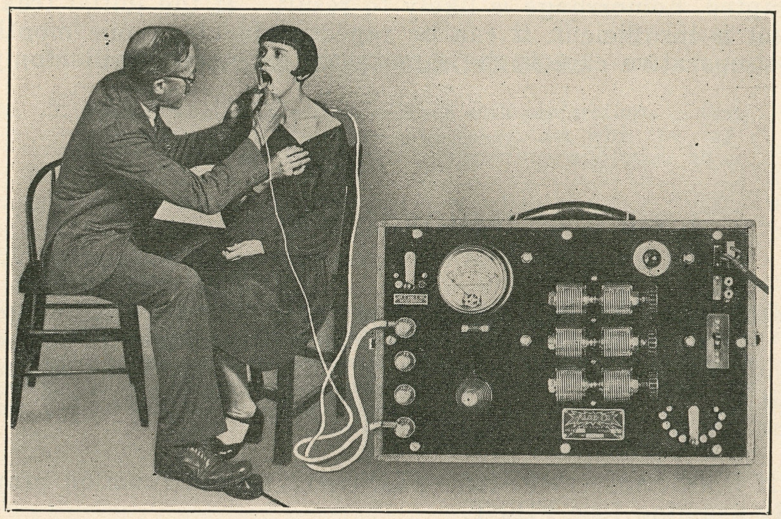
These small canker growths in the mouth may be immediately destroyed by mild desiccation. See section on Surgical Methods.

## TONSILS, Removal of

| | |
|---|---|
| Modality | Electro-coagulation. |
| Electrodes | Electro-coagulation needle. |
| Terminals | Indifferent and High or Medium. |
| Milliamperes | See directions. |
| Duration | See directions. |

Directions: The electro-surgical removal of Tonsils is daily gaining more advocates, and the success of the entire operation depend upon a careful technic.

Anaesthetize the tonsil and the peritonsillar tissues either by injection or by spraying with a 2% solution of Butyn. The tongue depressor must be of glass, rubber, or some other non-conducting material.



**Electro-coagulation of tonsils. Note indifferent electrode (6x8) applied at patient's back between shoulders, —foot switch also used. Note machine connections, switches, etc.**

The patient should be seated in a good light, as it is necessary to observe carefully the blanching of the tissue to determine the duration of treatment.

A block tin pad applied to the shoulder or the auto condensation handle held in the hands may be employed as the inactive electrode, and this is connected to the Indifferent Terminal. The active electrode is the special electro-coagulation needle, or one of the special electrodes made for the purpose. If the regular needle is employed, it should be covered with a rubber tube or catheter its entire length with the exception of about ¼ of an inch from the tip.

The Milliampere dosage to be employed depends largely upon the result desired. If the purpose is but to shrink an enlarged tonsil, it is necessary to use about 300 milliamperes. If total destruction is desired, use about 600 milliamperes. With everything in readiness, insert the needle into the tonsil and turn on the current by means of the foot switch. As soon as the tissue begins to blanch turn off the current, withdraw the needle, and insert at an adjacent point. The number of insertions to be made will depend upon the amount of destruction desired.

The Spark Gaps should be well opened if the HIGH VOLTAGE TERMINAL is to be used on electro-coagulation.

The destroyed tissue is left in place as it will separate and come away in about ten days. If forceful removal is attempted, hemorrhage is likely to result. If the initial treatment is insufficient, it can be repeated in about one month. Post-operative care is the same as in ordinary tonsillectomy.

## IMPORTANT!

**Meter Fuse** A fuse is placed in series with the m. a. meter to protect same as much as possible. In case of "shorting" electrodes or by overloading the circuit, this fuse will be "blown out." However, in extreme cases, both the fuse and meter have been burned out.

If Diathermy or D'Arsonval currents do not function properly examine fuse FIRST.

An imperfect fuse, burned out meter, loose connections to binding posts, imperfect cords to patients or improperly placed electrodes, may cause a shocking (faradic) sensation to the patient.

DO NOT operate this apparatus on a metal table.

## ACCESSORIES

| | | |
|---|---|---|
| No. 1. | **Surface Electrode**—Used for facial and body treatments | $ 1.00 |
| No. 2. | **Condenser Electrode**—Contains a disc which condenses the current, permitting deeper penetration and a smooth, strong flow of current. Very useful in neuritis, lumbago, neurasthenia and some skin diseases | 3.00 |
| No. 3. | **Comb-rake Electrode**—Used for scalp treatments, dandruff, falling hair, and for stimulating the hair cells | 2.00 |
| No. 4. | **Spinal Electrode**—For spinal treatments. A portion of the electrode reaches each side of the spinous process, thus treating the nerves of each side | 1.50 |
| No. 5. | **External Throat Electrode**—Fits very nicely over the neck and is useful in inflammations of the throat and neck | 1.50 |
| No. 6. | **Metal Electrode**—May be held by the patient to increase the circulation in the hands and arms | 1.00 |

## INSULATED ELECTRODES

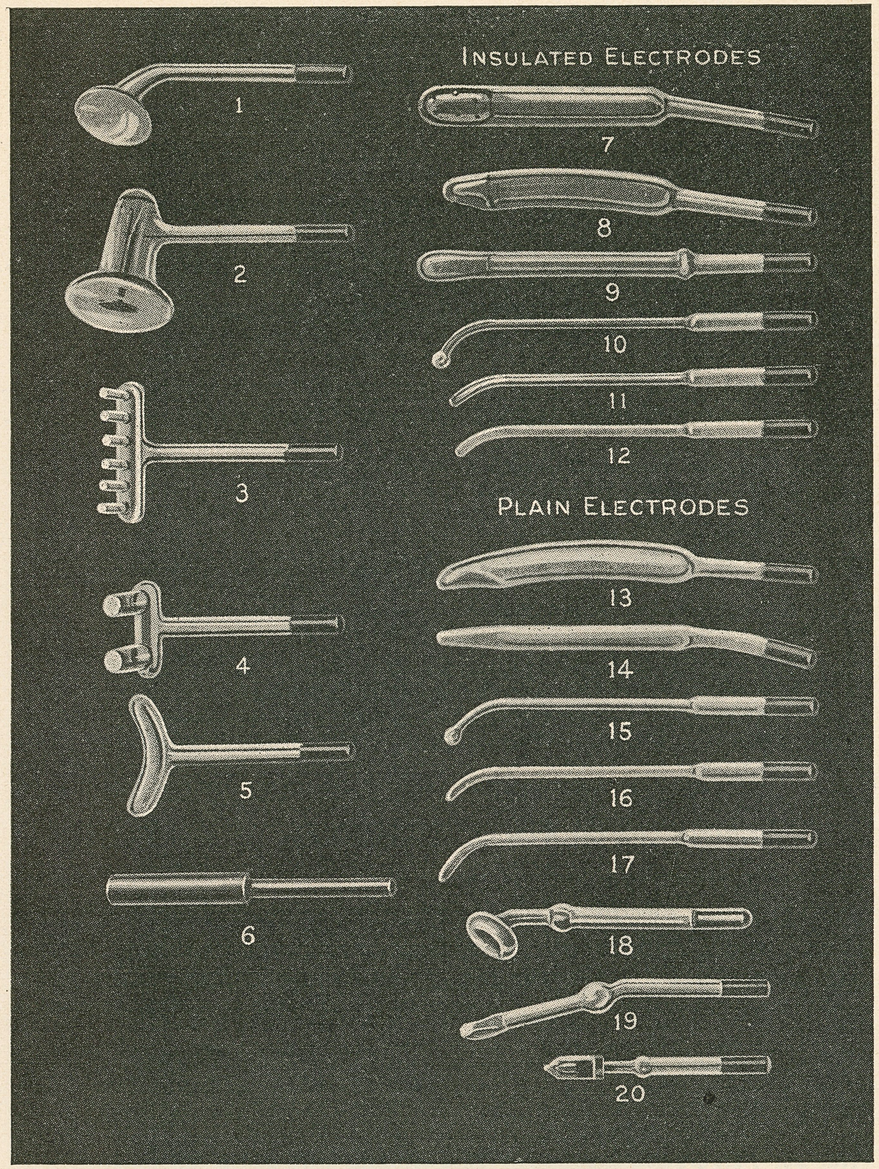
| | | |
|---|---|---|
| No. 7. | **Special Vaginal Electrode**—Made with perforations so that the ozone generated may come in contact with the vaginal tissues; used for vaginitis, leucorrhea, and other adjacent inflammation | 3.50 |
| No. 8. | **Vaginal Electrode**—Without perforations | 2.25 |
| No. 9. | **Prostatic Electrode**—Used in the treatment of prostatis | 2.00 |
| No. 10. | **Internal Throat Electrode**—Used for hypertrophied tonsils and tonsillitis | 2.00 |
| No. 11. | **Nasal Electrode**—Used for catarrhal conditions of the nose | 2.00 |
| No. 12. | **Urethral Electrode**—Useful in chronic gonorrhea | 2.00 |

The advantage of the insulated electrodes is that the current is carried to the end of the instrument where as otherwise much of the current will be carried off into the tissues at the first contact of the orifice.

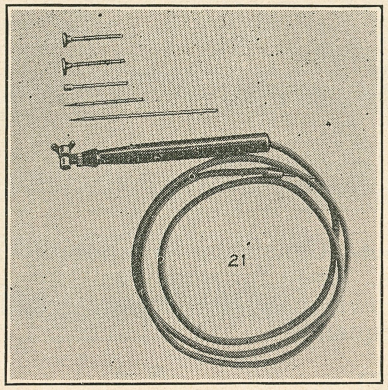
## PLAIN ELECTRODES

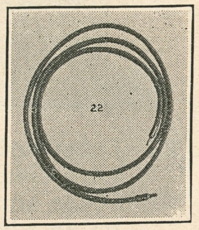
| | | |
|---|---|---|
| No. 13. | **Vaginal Electrode** | 1.00 |
| No. 14. | **Rectal Electrode** | 1.00 |
| No. 15. | **Throat Electrode** | 1.00 |
| No. 16. | **Nasal Electrode** | 1.00 |
| No. 17. | **Urethral Electrode** | 1.00 |
| No. 18. | **Eye Electrode**—Used to increase circulation and relieve congestion | 1.00 |
| No. 19. | **Spatula or Tongue Electrode**—Used in place of No. 1, in places where there are deep crevices difficult to reach with other | 2.00 |
| | **Ozone Generator** | 10.00 |
| No. 20. | **Fulguration Electrode**—This contains wire and a cap which is adjustable; good for removing warts, moles, or other small growths | 2.00 |
| | **Ear (Insulated)** | 2.00 |
| | **Actinic Ray** | 12.00 |
| | **Non-Vacuum Electrode** | $5.00 to 6.00 |
| | **Cataphoric** | 4.25 |

We also carry in stock many other vacuum electrodes

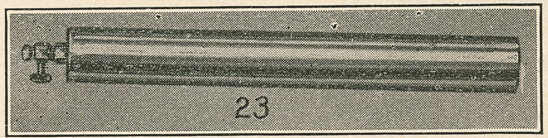


**Permits Easy, Safe and Complete Removal with minimum reactions.**

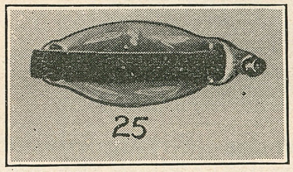


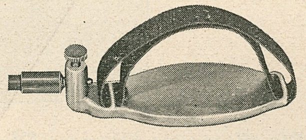


| | |
|---|---|
| No. 21. **Electro Coagulation Set**—Consisting of cord, handle, and five electrodes, two of which are needles, and the other three flat-headed electrodes to be held against the area to be treated | 7.50 |
| No. 22. **Diathermy, Auto Condensation Cords,** per pair | 2.50 |

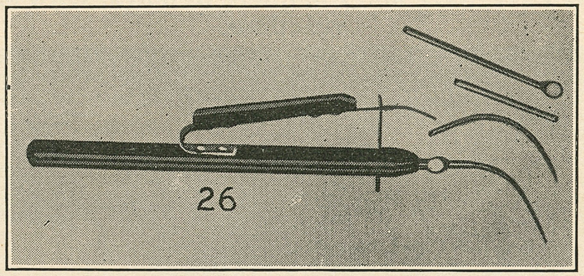


| | |
|---|---|
| No. 23. **Auto-condensation Handle**—Made of heavily coated nickel-plated brass tubing | 1.25 |

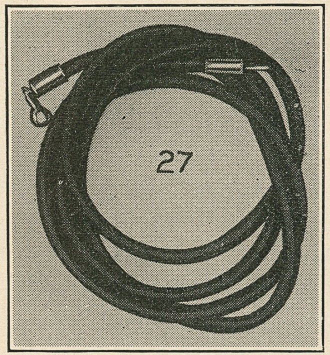




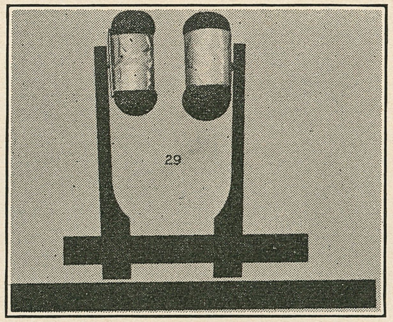
| | |
|---|---|
| No. 25. **Diathermy Hand Electrode**—Used when giving Diathermy with massage or when giving local treatment as to the ears, when the patient may hold one in each hand and place a finger in each ear, per pair | 2.50 |



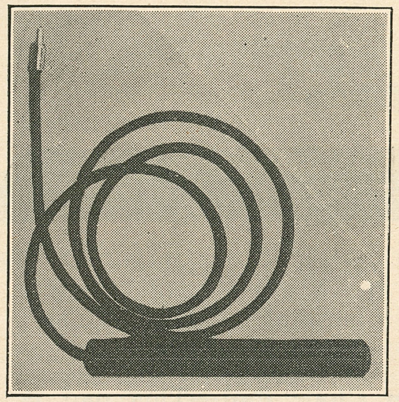
**No. 26. Fulguration Set**—Consisting of handle and wire electrodes. Used for removing warts and other small growths, by either bipolar or unipolar high frequency .......... **2.50**



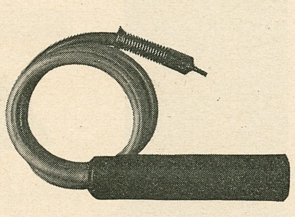
**No. 27. Heavy Insulated High Frequency Cord**—Extra heavily insulated, making it ideal for use with our fulguration set. At one end is a swivel connection which readily attaches to the fulguration handle. The other end is the standard cord tip.......... **1.25**



**No. 29. Sponge Clamp Electrodes**—Giving Diathermy with these is very simple. Place the pad on each side of the affected area. The clamp will hold the electrodes firmly in position. With this special electrode there is no crackling and sputtering as there is when the mesh electrodes are used .......... **10.60**



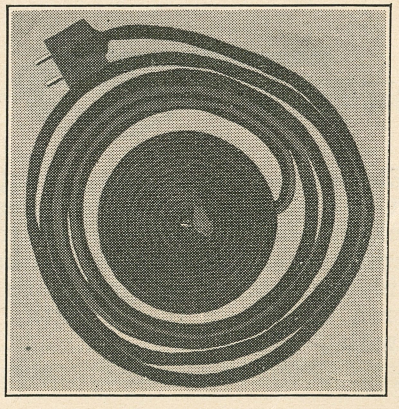
No. 32



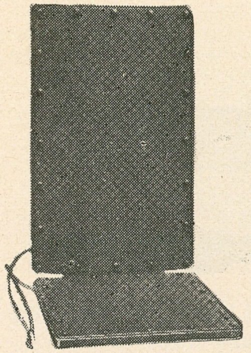
No. 32A

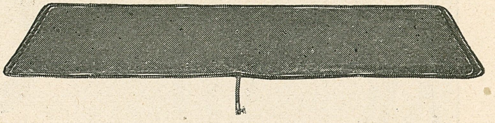
**No. 32. Insulated High Frequency Handle**—To be used with 7/16ths in. glass or metal tipped electrodes. Price .......... **3.00**

**No. 32A. Extra Heavily Insulated Cord and Shock Proof Handle**—To be used with ⅝ths in. stem or ⅝ths in. metal tipped electrodes. Price .... **3.75**



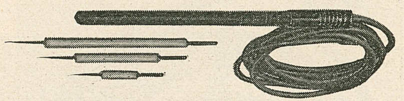
**No. 33. Foot Switch**—This is the most unique foot switch on the market, and is made of black bakelite, highly polished and very attractive. Switch will not upset and by stepping on any part of the circumference, a connection is sure to be made and is consequently much easier to handle than other switches. Price.......... **10.00**



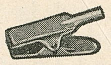


**No. 34. Auto Condensation Chair Pad**—This pad is made to conform to the shape of an ordinary chair. The conducting metal is supported by carefully selected five-ply veneer oak. The pad is well insulated, and the parts hinged, so that it may be placed on a table. ................ **10.00**

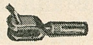
**No. 35. Flexible Pad**—Functions quite the same as the ordinary chair pad but has the advantage of being flexible and is preferable where the patient is to be treated in a reclining position. It may also be used with a chair. Price................ **12.00**



**No. 36. Plank Electrode**—Electrode-coagulation handle with points. This set is very desirable in electro-coagulation of hemorrhoids, tonsils, benign blemishes, etc. The cord and handle are thoroughly insulated. The points are also insulated for a portion of their length. Price of handle with 3 points ................................ **5.00**

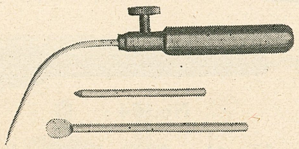


**No. 40**



**No. 41**

**Nos. 40-41. Block Tin, Mesh or ROSECO—Electrode** clamps or clips ..................No. 40, **.15**; No. 41 **.30**



**No. 60**

**No. 60. Combination Fulguration Electrode with three tips**—This fits the 7/16″ Shock Proof handle is also ideal for indirect method of fulguration when patient is seated on auto-condensation seat. The electrode held in hand of operator....**$ 1.75**

## ENDOCERVICITIS ELECTRODES

**No. 61**

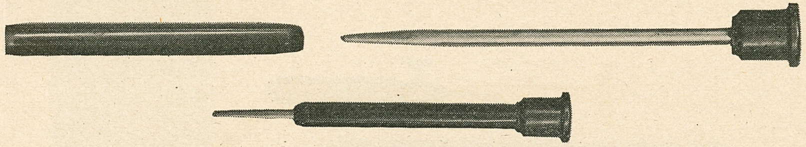
**No. 61. Urethral Electrode**—Cord tip fastens securely in end of electrode.............................................. **1.00**

**No. 62**

**No. 62. Urethral Electrode.** Same as No. 61 except cord tip secured by binding post........................ **1.50**

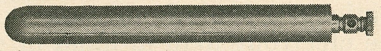
**No. 63**

**No. 63. Cervical Electrode**—Insulated except tip. May be taken apart and sterilized.............................. **2.50**



No. 64

**No. 64. Combination Urethral and Cervical Electrode**—Cuts plainly show long insulator removed for urethral work ........ 4.00



No. 65

**No. 65. Orificial Electrode**—This type electrode may be used for rectal, vaginal or prostatic applitions ........ 2.50

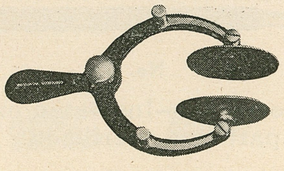
No. 66

**No. 66. Prostatic Electrode**—Properly shaped curved top face and insulated ........ 4.00

No. 67

**No. 67. Vaginal Electrode**—Is properly designed to fit the lips of the cervix and is designed for use with diathermy currents ........ 4.50

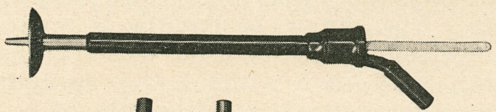
## EPIDIDYMITIS ELECTRODE

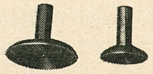


No. 68

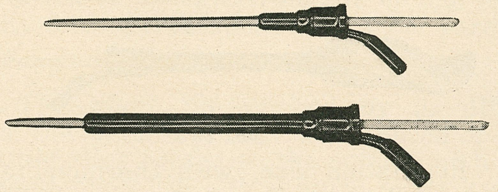
**No. 68.** A specially designed clamp arrangement for ministering diathermy current ........ 12.00

## CORBUS ENDOCERVICITIS ELECTRODE





72 70



No. 69

For the treatment of Gonorrheal Endocervicitis with Diathermy. Thermometer registers degree of heating obtained, Fahrenheit. Instrument consists of four pieces.

No. 69 Complete with thermometer and both insulators as illustrated, without concave disc ........ Price, 12.00

No. 70 Nickel plated Concave Disc for end of Corbus Electrode, for engaging lips of cervix—1 inch diameter, slips over rod ........ .35

No. 71 Same as No. 70 but of 1 1-14 inch diameter ........ .40

No. 72. Same as No. 70 but of 1 1-2 inch diameter .45

## PROSTATIC ELECTRODES

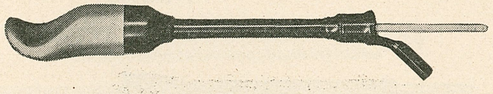
No. 73 Prostatic Electrode, same as No. 66, except with thermometer ........ 12.00

No. 74 Prostatic Electrode, Insulated over all with exception of curved top face ........ 6.50

No. 75 Same as No. 74, but with thermometer.... 12.00

## CHAPMAN VAGINAL ELECTRODE

This electrode is designed along scientific lines, with size and shape of polished metal end to properly engage the lips of the cervix. The shank, or handle, is made of hard rubber. This electrode is to be used with Diathermy Current. Supplied both with and without the special thermometer which permits the accurate maintenance of an exact temperature within the vagina. This instrument is of extreme value in the treatment by diathermy of painful or inflammatory conditions of the female pelvis.



No. 76

| | | |
|---|---|---|
| No. 76 | Regulation size, with thermometer. Shank 1 3-16 in. diameter, cervical bowl 1¾ in. wide and ⅜ in. thick. Handle of hard rubber | Price, $12.00 |
| No. 77 | Without thermometer | “ 6.50 |
| No. 78 | Small size, with thermometer. Shank 15-16 in. diameter, cervical bowl 1 7-16 in. wide, 5-16 in. thick. Hard rubber handle | “ 12.00 |
| No. 79 | Without thermometer | “ 6.50 |
| No. 80 | Regulation size, as No. 76, with thermometer and with cord and insulated joint | “ 13.75 |
| No. 81 | Small size, as No. 78, with thermometer and with cord and insulated joint | “ 13.75 |

## THERMOMETERS FOR DIATHERMY

| | | |
|---|---|---|
| No. 82 | Thermometer for Internal Diathermy Electrodes (Fahrenheit scale) | Price, $ 2.00 |
| No. 83 | As No. 82, Centigrade scale | “ 2.00 |

**WE CARRY MANY OTHER ELECTRODES IN STOCK, OF ALL SORTS AND FOR ALL PURPOSES, WHICH WE HAVE NOT LISTED IN THIS BOOK.**

**Roseco Material** — This material has been created after much experimentation and research and is preferable by far to any other electrode material yet devised for the application of Diathermy to parts of the body where it is difficult to make block tin electrodes conform to the contour of the body. It insures splendid contact and eliminates the burning caused by point contact so often experienced with either block tin or mesh electrodes. It is very inexpensive considering its advantages. It does not spark or crackle from the effects of electricity during treatment. Price per yard, 6 in. wide .50

**Block Tin** — The block tin stocked by us differs from the usual in that it is composed of a soft, flexible alloy coated on the outside with layers of pure block tin. It is much more desirable than the usual block tin offered. Price per pound, 12 in. wide .75

**Physiotherapy Books:**

- Diathermy and Its Application to Pneumonia—Stewart.
- Diathermy in the Treatment of G. U. Diseases, with special reference to cancer—Corbus and O'Connor.
- Handbook of Electrotheraphy—Grover.
- High Frequency Practice—Grover.
- Artificial Sunlight and Its Therapeutic Uses—Humphries.
- Physiotherapy Technique—Sampson.
- Diathermy—Saberton.
- The Principles of Electrotheraphy—Turrel.

S967